CLAIMS

1.   A fully charged state detecting device comprising charging efficiency detecting means for detecting a charging efficiency which indicates a ratio of an electrical quantity to be stored in a battery as electromotive force to an electrical quantity flowed into the battery at any time point from a start of charging to an end of charging of the battery, wherein a fully charged state of the battery is detected when the detected charging efficiency can be regarded as zero.

2.   The fully charged state detecting device according to claim 1, wherein the charging efficiency detecting means detects the charging efficiency of the battery on the basis of a ratio of a difference between an internal resistance value at a time point when a charging of the battery is started and an internal resistance value at any time point from a start of charging to an end of charging of the battery to an internal resistance value in a fully charged state of the battery.

3.   A state-of-charge detecting device for estimating a state of charge indicating an electrical quantity stored in a battery comprising state-of-charge detecting means for detecting a relative value of an electrical quantity stored in the battery at any time point as the state of charge, wherein the electrical quantity stored in the battery at a time point when the fully charged state detecting device according to claim 1 or 2 detects the fully charged state is set to be 100%, while the electrical quantity stored in the battery at an end of discharging is set to be 0%.

4.   A degradation degree detecting device for estimating a degradation degree of a battery comprising degradation degree detecting means for

detecting a relative value of an electrical quantity stored in the battery at a time point when the fully charged state detecting device according to claim 1 or 2 detects the fully charged state as a degradation degree, wherein the electrical quantity stored in a brand-new battery in its fully charged state is set to be 100%, while the electrical quantity stored in the battery at an end of discharging is set to be 0%.

5. A fully charged state detecting method, characterized in that a fully charged state of a battery is detected when a charging efficiency, which is a ratio of an electrical quantity to be stored in a battery as electromotive force to an electrical quantity flowed into the battery at any time point from a start of charging to an end of charging of the battery, can be regarded as zero.

6. A state-of-charge detecting method for estimating a state of charge indicating an electrical quantity stored in a battery, characterized in that a relative value of an electrical quantity stored in the battery at any time point is detected as the state of charge, wherein the electrical quantity stored in the battery at a time point when the fully charged state is detected by using the fully charged state detecting method according to claim 5 is set to be 100%, while the electrical quantity stored in the battery at an end of discharging is set to be 0%.

7. A degradation degree detecting method for estimating a degradation degree of a battery, characterized in that a relative value of an electrical quantity stored in the battery at a time point when the fully charged state is detected by using the fully charged state detecting method according to claim 5 is detected as a degradation degree, wherein the electrical quantity stored in a brand-new battery in its fully charged state is set to

be 100%, while the electrical quantity stored in the battery at an end of discharging is set to be 0%.